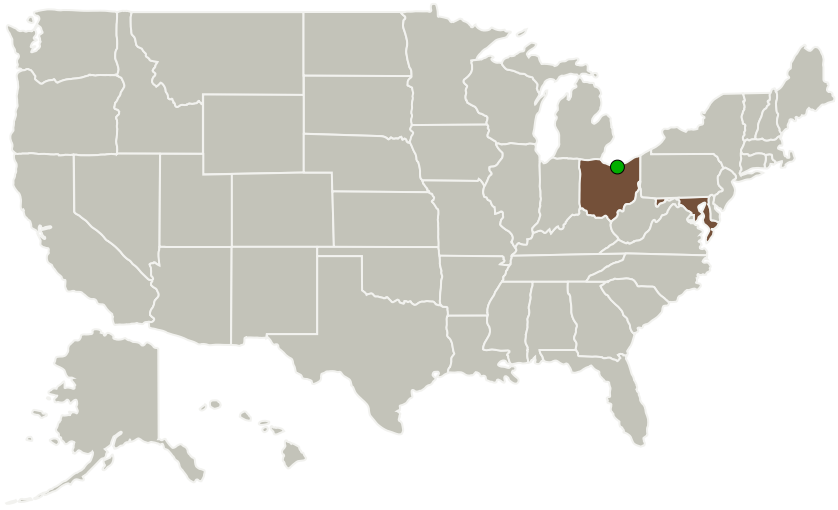
A High Performance Approach to Minimizing Interactions between Inbound and Outbound Signals in Helmet, Phase I

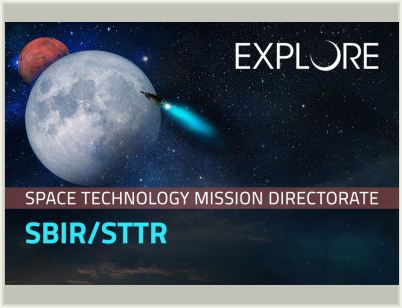
Completed Technology Project (2010 - 2010)

Project Introduction

We propose a high performance approach to enhancing communications between astronauts. In the new generation of NASA audio systems for astronauts, inbound signals may interfere with outbound signals and create an annoying positive feedback during communications. Our objective is to eliminate the inbound signals in the outbound path. We propose to apply an affine projection algorithm (APA) to achieve the above objective. In our recent studies, it was found that APA achieves a balance between performance (convergence speed) and computational complexity, as compared to least mean square (LMS) and recursive least square (RLS) algorithms. Our preliminary simulation results showed that the proposed framework is promising. In Phase 1, we will perform extensive simulations to prove the feasibility of our approach. In Phase 2, the validated algorithms will be implemented in radiation hardened DSP or Field Programmable Gate Array (FPGA).

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Signal Processing, Inc.	Lead Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Rockville, Maryland
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Maryland	Ohio

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138729)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Signal Processing, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

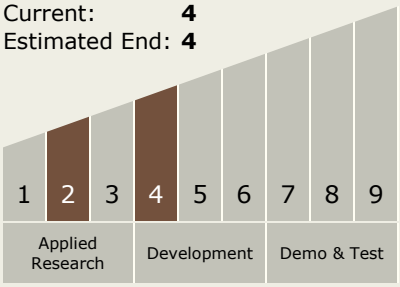
Carlos Torrez

Principal Investigator:

Chiman Kwan

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.1 Spectrum-Efficiency

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System